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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/892,161	06/26/2001	Michael R. Ohran	14113.3.2.2	4716

7590   01/17/2006

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EXAMINER
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ART UNIT	PAPER NUMBER
3624	

DATE MAILED: 01/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/892,161	OHRAN, MICHAEL R.
	Examiner	Art Unit	
	Ella Colbert	3624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>31 October 2005</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 9-39* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 9-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-7 and 9-39 are pending. Claims 1, 9, 16, 20, and 28 have been

amended in this communication filed 10/31/05 entered as Request for Continued

Examination.

Continued Examination Under 37 CFR 1.114

2.   A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this

application is eligible for continued examination under 37 CFR 1.114, and the fee set

forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on

10/31/05 has been entered.

Drawings

3.   The drawings are objected to under 37 CFR 1.83(b) because they are

incomplete. 37 CFR 1.83(b) reads as follows:

> When the invention consists of an improvement on an old machine the drawing
> must when possible exhibit, in one or more views, the improved portion
> itself, disconnected from the old structure, and also in another view, so
> much only of the old structure as will suffice to show the connection of
> the invention therewith.

Figure 3, element "302"; Figure 5, "user workstation 502"; Figures 6 and 7, "302"

are missing in the drawings.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in

reply to the Office action to avoid abandonment of the application. Any amended

replacement drawing sheet should include all of the figures appearing on the immediate

prior version of the sheet, even if only one figure is being amended. The figure or figure

number of an amended drawing should not be labeled as "amended." If a drawing

figure is to be canceled, the appropriate figure must be removed from the replacement

sheet, and where necessary, the remaining figures must be renumbered and

appropriate changes made to the brief description of the several views of the drawings

for consistency. Additional replacement sheets may be necessary to show the

renumbering of the remaining figures. Each drawing sheet submitted after the filing date

of an application must be labeled in the top margin as either "Replacement Sheet" or

"New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the

examiner, the applicant will be notified and informed of any required corrective action in

the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to because Figure 2 for elements "21, 24, 25, 32-38,

36a, 36b, 46-48, 49a, 49b, 50a, 50b, and 51-53 the text is illegible; and Fig. 2 should be

at the bottom of the drawing page. Corrected drawing sheets in compliance with 37

CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the

application. Any amended replacement drawing sheet should include all of the figures

appearing on the immediate prior version of the sheet, even if only one figure is being

amended. The figure or figure number of an amended drawing should not be labeled as

"amended." If a drawing figure is to be canceled, the appropriate figure must be

removed from the replacement sheet, and where necessary, the remaining figures must

be renumbered and appropriate changes made to the brief description of the several

views of the drawings for consistency. Additional replacement sheets may be necessary

to show the renumbering of the remaining figures. Each drawing sheet submitted after

the filing date of an application must be labeled in the top margin as either

"Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are

not accepted by the examiner, the applicant will be notified and informed of any required

corrective action in the next Office action. The objection to the drawings will not be held

in abeyance.

Specification

4.   The Specification is objected to because in the Specification the following was

found: reference to Fig. 1, elements "102a, 102b, 102c, 102n, 115, 125, 135, and 142

are not described in reference to this figure; Fig. 2, element "47 (monitor)" is not

mentioned; Figures 3 and 4, elements "302a-302n" are missing; Figure 5, "server A

520" is in the Specification but "server 510A" is missing; "315" is referenced as

"dedicated link" but in the drawing figures 6 and 7 "dedicated link" is labeled as "615"

and in drawing figure 4, "Dedicated Link is element "315"; Figure 7, "policing protocol

311" is missing; and Figure 8, elements "502a-502d are missing in the Specification.

Correction is required. See MPEP § 608.01(b).

Claim Objections

5.   Claim 20 is objected to because of the following informalities: Claim 20, page 8,

lines 24 and 25 recite "... device; thereby enabling ...". These lines would be better

recited as ""... device; and thereby enabling ...". Appropriate correction is required.

Claim Rejections - 35 USC § 112

6.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

7.   Regarding claim 10, the word "means" is preceded by the word(s) "for mirroring

data comprises a first mirror engine associated with the first server and a second mirror

engine associated with the second server" in an attempt to use a "means" clause to

recite a claim element as a means for performing a specified function. However, since

no function is specified by the word(s) preceding "means," it is impossible to determine

the equivalents of the element, as required by 35 U.S.C. 112, sixth paragraph. See *Ex*

parte Klumb, 159 USPQ 694 (Bd. App. 1967). Claims 12 and 13 appear to have a

similar problem.

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

9.   Claims 1-7 and 9-22 and 28-39 are rejected under 35 U.S.C. 103(a) as being

unpatentable over (WO 95/00906) Rollins et al, hereafter Rollins and (US 5,157,663)

Major et al, hereafter Major further in view of (US 6,047,356) Anderson et al, hereafter

Anderson.

As per claim 1, Rollins teaches, A method of mirroring data stored on a first

server having a first mass storage device to a second server having a second mass

storage device so as to establish a virtual storage area network, the method comprising:

receiving a write request at the first server from a network device (page 6, lines 1-15);

determining that the first server has write access to the first mass storage device and to

the second mass storage device (page 7, lines 10 –21 and page 8, line 16-page 9, line

14); using an I/O driver of the first server, executing the write request at the first server

to write data to the first mass storage device (page 26, lines 5-21). Rollins failed to

teach, using a mirror engine of the first server, transmitting a copy of the write request

the second server; and executing the copy of the write request at the second server to

write the data to the second mass storage device, without processing the write request

using an I/O driver of the second server, thereby mirroring the data at the second mass

storage device, wherein the data is stored in a virtual shared storage node associated

with the first server and the second server. Major teaches, using a mirror engine of the

first server, transmitting a copy of the write request to the second server (col. 8, lines

56-64). Rollins and Major failed to teach, executing the copy of the write request at the

second server to write the data to the second mass storage device, without processing

the write request using an I/O driver of the second server, thereby mirroring the data at

the second mass storage device, wherein the data is stored in a virtual shared storage

node associated with the first server and the second server. Anderson teaches,

executing the copy of the write request at the second server to write the data to the

second mass storage device, without processing the write request using an I/O driver of

the second server, thereby mirroring the data at the second mass storage device,

wherein the data is stored in a virtual shared storage node associated with the first

server and the second server (col. 7, line 26-col. 8, line 23 and line 65- col. 10, line 33

and line 61-col. 11, line 7 and line 54- col. 12, line 11). It would have been obvious to

one having ordinary skill in the art at the time the invention was made to use a mirror

engine of the first server, transmit a copy of the write request at the second server,

execute the copy of the write request at the second server to write the data to the

second mass storage device, without processing the write request using an I/O driver of

the second server, thereby mirroring the data at the second mass storage device,

wherein the data is stored in a virtual shared storage node associated with the first

server and the second server and to combine Rollins' receiving a write request at the

first server from a network device; determining that the first server has write access to

the first mass storage device and to the second mass storage device; and executing the

write request at the first server so as to write data to the first mass storage device with

Major's using a mirror engine of the first server, transmitting a copy of the write request

to the second server; and Anderson's executing the copy of the write request at the

second server to write the data to the second mass storage device, without processing

the write request using an I/O driver of the second server, thereby mirroring the data at

the second mass storage device, wherein the data is stored in a virtual shared storage

node associated with the first server and the second server because such a

combination would allow Rollins' and Major's systems to have the ability to backup data

and to restore the data without losing any of the data because of a network disaster.

As per claim 2, Rollins teaches, A method of mirroring data as recited in claim

1, wherein transmitting a copy of the write request comprises transmitting the copy of

the write request using a dedicated link between the first server and the second server

(page 15, lines 4-17 and page 23, line 13 – page 24, line 12).

As per claim 3, Rollins teaches, A method of mirroring data as recited in claim 1,

wherein transmitting a copy of the write request comprises transmitting the copy of the

write request using infrastructure of the network, wherein the infrastructure is used by

the network to transmit data between workstations and servers (page 13, line 16 –page

14, line 14 and page 17, line 3- page 18, line 12).

As per claim 4, Rollins teaches, A method of mirroring data as recited in claim

1, further comprising: experiencing a failure such that the data is not accessible from the

first mass storage device; and executing a read request for data that has been written to

the first mass storage device by accessing the data that has been mirrored at the

second mass storage device (page 10, lines 1-21).

As per claim 5, Rollins teaches, A method of mirroring data as recited in claim 4,

wherein the failure comprises the first server going offline (page 21, line 18 –page 23,

line 12).

As per claim 6, Rollins teaches, A method of mirroring data as recited in claim 4,

wherein the failure comprises a failure of the first mass storage device (page 22, lines 8-

18).

As per claim 7, Rollins failed to teach, A method of mirroring data as recited in

claim 1, further comprising using a policing protocol, prior to executing the write request

at the, first server, to determine whether the first server has write access. Major

teaches, A method of mirroring data as recited in claim 1, further comprising using a

policing protocol, prior to executing the write request at the, first server, to determine whether the first server has write access (col. 2, lines 42-63 and col. 6, lines 39-48). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a policing protocol, prior to executing the write request at the, first server, to determine whether the first server has write access and to combine Rollins' first server with the write access with Major's using a policing protocol prior to executing the write request at the, first server, to determine whether the first server has write access because such a modification would allow Rollins' and Major's systems to have the servers synchronized prior to the secondary operating system reaching a stable state.

As per claim 9, Rollins teaches, A method of mirroring data stored on a first server having a the first mass storage device to the second mass storage device of a second server so that the data is accessible to the first server and the second server through a virtual storage area network, the method comprising: establishing a virtual storage area network between the first server and the second server that ncludes a virtual shared storage node, wherein the virtual shared storage node physically includes the first mass storage device (page 17, line 3- page 18, line 12); the second mass storage device (page 18, line 13- page 19, line 5); means for mirroring data between the first mass storage device and the second mass storage device (page 20, lines 4-15); and means for communicating between the first server and the second server (page 17, lines 3-18). This independent claim is rejected for the similar rationale as given above for claim 1.

As per claim 10, Rollins failed to teach, A method of mirroring data as recited in claim 9, wherein said means for mirroring data comprises a first mirror engine associated with the first server and a second mirror engine associated with the second server. Major teaches, wherein said means for mirroring data comprises a first mirror engine associated with the first server and a second mirror engine associated with the second server (col. 9, lines 17-36). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have means for mirroring data comprises a first mirror engine associated with the first server and a second mirror engine associated with the second server and to combine Rollins' mirroring data with Major's means for mirroring data comprises a first mirror engine associated with the first server and a second mirror engine associated with the second server because such a combination would allow Rollins' and Major's systems to have a primary engine and a secondary engine for mirroring data with both engines being synchronized.

As per claim 11, this dependent claim is rejected for the similar rationale as given above for claims 2, 3, and 10.

As per claim 12, this dependent claim is rejected for the similar rationale as given above for claim 1.

As per claim 13, this dependent claim is rejected for the similar rationale as given above for claim 3.

As per claim 14, this dependent claim is rejected for the similar rationale as given above for claim 4.

As per claim 15, this dependent claim is rejected for the similar rationale as given above for claim 9.

As per claim 16, this dependent claim is rejected for the similar rationale as given above for claims 1, 7, and 14..

As per claim 17, this dependent claim is rejected for the similar rationale as given above for claim 7.

As per claim 18, this dependent claim is rejected for the similar rationale as given for above for claim 3.

As per claim 19, this dependent claim is rejected for the similar rationale as given above for claims 4 and 14.

As per claim 20, this independent claim is rejected for the similar rationale given to claims 1-7 and 9-19.

As per claim 21, this dependent claim is rejected for the similar rationale as given above for claim 2.

As per claim 22, this dependent claim is rejected for the similar rationale as given above for claim 3.

As per claim 28, this dependent claim is rejected for the similar rationale as given above for claim 1.

As per claim 29, this dependent claim is rejected for the similar rationale as given above for claim 1.

As per claim 30, this dependent claim is rejected for the similar rationale as given above for claim 2.

As per claim 31, this dependent claim is rejected for the similar rationale as given above for claim 3.

As per claim 32, this dependent claim is rejected for the similar rationale as given above for claim 10.

As per claim 33, this dependent claim is rejected for the similar rationale as given above for claim 14.

As per claim 34, this dependent claim is rejected for the similar rationale as given above for claim 5.

As per claim 35, this dependent claim is rejected for the similar rationale as given above for claim 6.

As per claim 36, this dependent claim is rejected for the similar rationale as given above for claim 2.

As per claim 37, this dependent claim is rejected for the similar rationale as given above for claim 3.

As per claim 38, this dependent claim is rejected for the similar rationale as given above for claim 1.

As per claim 39, this dependent claim is rejected for the similar rationale as given above for claim 7.

Claim Rejections - 35 USC § 103

10.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11.   Claims 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over (WO 95/00906) Rollins et al, hereafter Rollins, (US 5,157,663) Major et al, hereafter Major, and (US 6,047,356) Anderson et al, hereafter Anderson in view of (US 5,276,867) Kenley et al, hereafter Kenley.

As per claim 23, Rollins, Major, and Anderson failed to teach, A virtual storage area network as recited in claim 20, further comprising a third server that is capable of receiving write requests and read requests from network clients, the third server having: a third mass storage device; and a third mirror engine, wherein the third mirror engine is capable of mirroring, to the first mass storage device and the second mass storage device, data that is to be written to the third mass storage device. Kenley teaches, A virtual storage area network as recited in claim 20, further comprising a third server that is capable of receiving write requests and read requests from network clients, the third server having: a third mass storage device; and a third mirror engine, wherein the third mirror engine is capable of mirroring, to the first mass storage device and the second mass storage device, data that is to be written to the third mass storage device (col. 2, lines 44-55, col. 4, lines 61-66, and col. 6, lines 40-56). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a third server that is capable of receiving write requests and read requests from network clients, the third server having: a third mass storage device; and a third mirror engine, wherein the third mirror engine is capable of mirroring, to the first mass storage device and the second mass storage device, data that is to be written to the third mass storage

device and to combine Rollins' data mirroring and Major's O/I engine with Kenley's third

server that is capable of receiving write requests and read requests from network

clients, the third server having: a third mass storage device; and a third mirror engine,

wherein the third mirror engine is capable of mirroring, to the first mass storage device

and the second mass storage device, data that is to be written to the third mass storage

device because such a combination would allow Rollins', Major's and Kenley's systems

to have a third server as a backing store (hierarchical storage server that has a higher

capacity and lower speed than the secondary storage and can include erasable optical,

write-once-read-many (WORM disks, or tape volumes.

As per claim 24, Rollins, Major, and Anderson failed to teach, A virtual storage

area network as recited in claim 23, further comprising means for communicating

between the third server and the first server and also between the third server and the

second server. Kenley teaches, A virtual storage area network as recited in claim 23,

further comprising means for communicating between the third server and the first

server and also between the third server and the second server (col. 7, lines 51-62). It

would have been obvious to one having ordinary skill in the art at the time the invention

was made to have means for communicating between the third server and the first

server and also between the third server and the second server and to combine Rollins'

data mirroring and Major's O/I engine with Kenley's communicating between the third

server and the first server and also between the third server and the second server

because such a combination would allow Rollins', Major's and Kenley's systems to have

the backing storage (third server) to have control fro the backup system by using a baseline backup and an incremental backup.

As per claim 25, Rollins failed to teach, A virtual storage area network as recited in claim 20, wherein the first server and the second server execute a policing protocol to determine whether a server, upon receiving a write request, has write access priority for writing data to the first mass storage device and the second mass storage device. Major teaches, A virtual storage area network as recited in claim 20, wherein the first server and the second server execute a policing protocol to determine whether a server, upon receiving a write request, has write access priority for writing data to the first mass storage device and the second mass storage device (col. 2, lines 42-63 and col. 6, lines 39-48). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the first server and the second server execute a policing protocol to determine whether a server, upon receiving a write request, has write access priority for writing data to the first mass storage device and the second mass storage device and to combine Rollins' data mirroring with Major's first server and the second server execute a policing protocol to determine whether a server, upon receiving a write request, has write access priority for writing data to the first mass storage device and the second mass storage device because such a combination would allow Rollins' and Major's systems to have a high speed connection and to have the primary and backup processing systems on separate computers.

As per claim 26, this dependent claim is rejected for the similar rationale as given above for claims 23-25.

As per claim 27, this dependent claim is rejected for the similar rationale as given above for claims 23-26.

Conclusion

12.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Teorey, Toby J. and Pinkerton, Tad B. disclosed the analysis of disk scheduling policies.

Chen, Shenze and Towsley, Don disclosed the performance of a mirrored disk.

Cao, Pei, Felten, Edward W., Karlin, Anna R., and Li, Kai disclosed disk scheduling, file caching and prefetching.
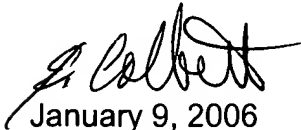
Inquiries

13.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ella Colbert whose telephone number is 571-272-6741. The examiner can normally be reached on Tuesday-Thursday, 6:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vincent Millin can be reached on 571-272-6747. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

January 9, 2006
E. Colbert
Primary Examiner